

RADIOCOMMUNICATION ON FREQUENCIES EXCEEDING PREDICTED VALUES

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There is now available a considerable body of evidence showing that satisfactory radiocommunication can often be established on frequencies higher than the maximum usable values predicted for the conditions in question. A study of some evidence of this kind is made in the paper.

The experimental evidence considered consists mainly of a series of observations of satisfactory reception over a distance of 1 800 km on frequencies 1 to 6 Mc/s higher than the expected values. The possible influences of region F2 and of the sporadic-E (or abnormal-E) layer are discussed. The irregular cloudlike structure of the sporadic-E layer may give rise to transmission along paths other than the true great-circle path,

by way of this layer. The practical importance of sender power and receiver sensitivity in enabling weak sporadic-E-layer reflections to be utilized in communication work is also emphasized. Some of the observed cases in which communication is effected on frequencies above the mean calculated values can certainly be ascribed to the marked day-to-day variability in region-F2 characteristics. The remaining cases show no marked disagreement with the conclusion that reflections from the sporadic-E layer are responsible for the received signals.

A study has also been made of some Japanese observations on the propagation of 30-Mc/s waves during the period June 1935–December 1939, over distances of 1 500 km and 3 000 km. The results have been compared with the available ionospheric data relating to region F2 and to the sporadic-E layer, and are

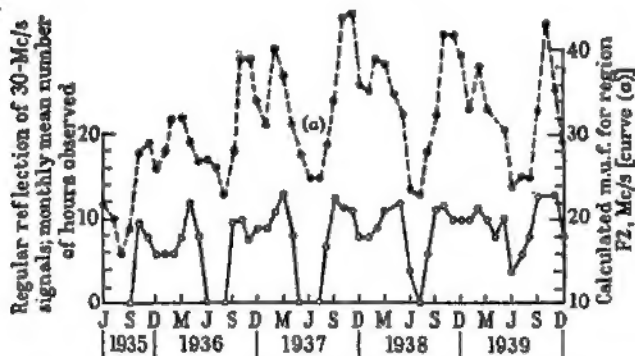


Fig. 1.—Reception of 30-Mc/s signals in Japan during 1935–39.
Sender-receiver distance = 3 000 km.

and an isolated normal-incidence observation of ionospheric conditions, even if made exactly at the mid-point between sender and receiver, may not permit complete prediction of transmission

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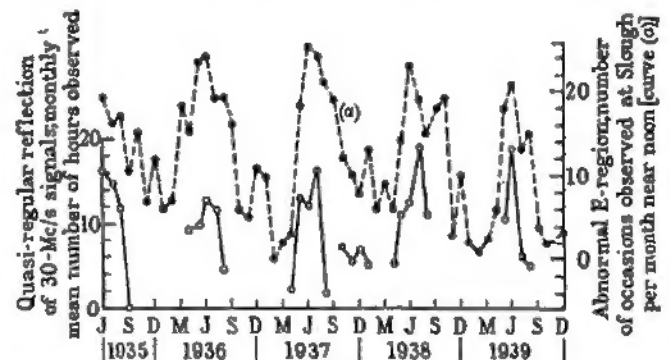


Fig. 2.—Reception of 30-Mc/s signals in Japan during 1935–39.
Sender-receiver distance = 1 500 km.

illustrated in Figs. 1 and 2. It would appear that the general nature of the whole of these 30-Mc/s results can again be explained in terms of reflection from region F2 and from the sporadic-E layer.